

**Wetland and Riparian Restoration on the Bosque del Apache NWR:
Phase I Saltcedar Control**

Fiscal Year 2002 Project 8230 Final Report

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Background:

The riparian zone of the Bosque del Apache National Wildlife Refuge (NWR) was historically characterized as a mosaic of woodlands, brushlands, marshes, and meadows supporting diverse faunal assemblages. Periodic flooding events on the Rio Grande encouraged river meandering and dynamic changes in vegetative communities. The pristine nature of the floodplain changed irreversibly through the 20th century, however. Major irrigation developments on the Rio Grande began by 1914 with the construction of reservoirs, conveyance canals and drains which changed the annual river hydrograph and resulted in the loss of wetland and meadow habitats. Changes in river flow management curtailed the regeneration of native woody plants which historically released seed coinciding with late spring flooding events. In this void exotic saltcedar vegetation, introduced during this same time period, has flourished and now dominates wide areas. The depletion of these habitats encouraged the U.S. Fish and Wildlife Service to establish the Bosque del Apache NWR in 1939. In the absence of periodic severe flooding which set back vegetative succession and rejuvenated floral communities, needed disturbance has been accomplished mechanically through the use of heavy equipment. Disturbance has often been accomplished in conjunction with saltcedar (*Tamarix ramossima*) removal prior to restoration with native riparian woody species. Wildlife has responded quickly along with a growing public interest in wildlife oriented recreation. Although recent advances are encouraging, severe shortages of quality wetland and riparian habitat are apparent in the Middle Rio Grande Valley. It is generally recognized that some of the greatest potential for restoring these habitats is at Bosque del Apache NWR.

Description of Study Area:

Funding resources including the North American Wetlands Council Act, the National Fish and Wildlife Foundation, the Bosque Improvement Group, Friends of the Bosque del Apache NWR, the U.S. Fish and Wildlife Service (FWS) Challenge Cost Share Program, Wildland Urban Interface (FWS) fire funding, New Mexico State University, and the Middle Rio Grande ESA Collaborative Program were combined to control exotic saltcedar on 961 acres of the Bosque del Apache NWR (Figure 1). New riparian forest, revegetated xeric riparian areas, saltgrass meadow, seasonal wetlands, and semi-permanent riparian wetlands will be developed utilizing refuge water delivery capabilities, water resources, and labor. Semipermanent riparian wetland development over approximately 99 acres (unit 34A) (Figure 1) is intended to meet habitat

requirements for the southwestern willow flycatcher, an endangered species which breeds on the refuge.

Purpose and Objectives:

Middle Rio Grande ESA Collaborative Program Funding consisting of \$30,000 was solicited to be used to treat 230 acres of saltcedar monoculture with an aerially applied herbicide and then burned as a first phase of saltcedar control.

Results:

Approximately 230 acres of dense saltcedar monoculture was sprayed with a combination of imazapyr (1 quart) and glyphosate (1 quart) solution in 15 gallons of water using a helicopter boom sprayer in early September, 2002 (Figure 2). Monitoring was conducted in July, 2003 using 50m x 2 m belt transects (n=32). Results showed 69% of live saltcedar plants were killed. A prescribed burn is scheduled for August, 2004 to remove dead saltcedar trunks and stems. Mechanical root plowing and raking will occur over the area in late 2004 and 2005 to achieve 98-99% control. Using a combined herbicide-burn/mechanical control approach, costs are reduced from an estimated \$700/acre to about \$400/acre (herbicide application followed by burning (\$130/acre) and then followed by mechanical rootplowing and raking (\$270/acre).

Habitat Restoration:

Following successful saltcedar control (98-99%), irrigation management will begin in 2006 in unit 33 to favor saltgrass meadow restoration, and in unit 34A to favor semi-permanent riparian wetland management (Figure 1). Units 33 and 34A are hydrologically connected through surface and sub-surface water resources and must be managed as a single management area.

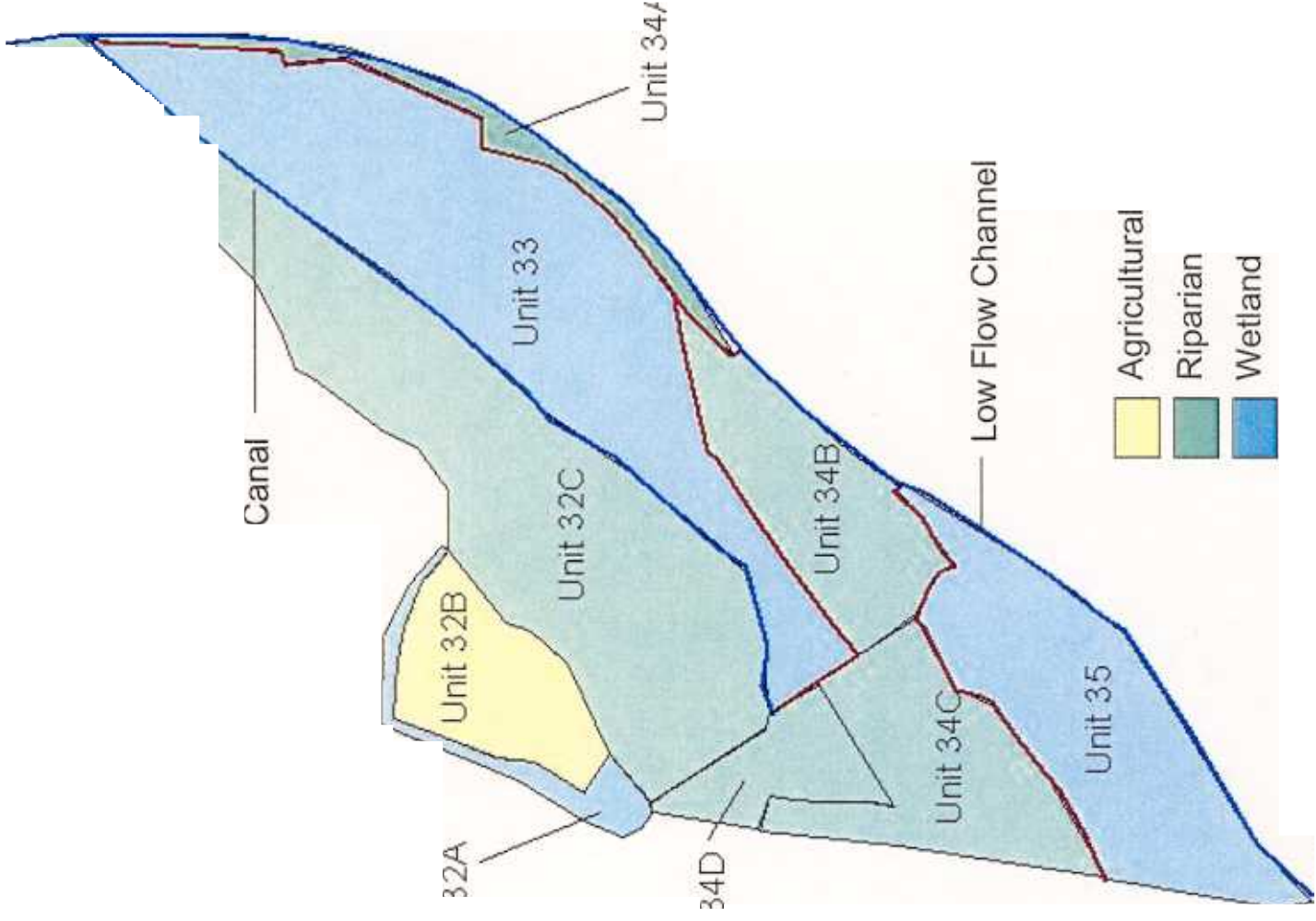
Figure 1. Overall habitat expansion on the Bosque del Apache NWR totaling 961 acres.

Figure 2. Aerial view from north of saltcedar block treated with herbicide in September, 2002.

Future Habitat Conversion:

New Units

32A	25 acres
32B	73 acres
32C	265 acres
33	272 acres
34A	99 acres
34B	91 acres
34C	95 acres
34D	41 acres
35	142 acres
Total 961 acres	





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